**Basic Lab Considerations:**

**1. Set up a. What quantity of materials is needed for each group/student? b. Space use in room? c. Lab stations clearly labeled? d. Sufficient work area for students?**

**A.** Each student will need:

• 1 *Kidney Dialysis Handout*

• 1 color *Hemodialysis* and *Peritoneal Dialysis* (Consider laminating this for reuse)

• Safety goggles

Each team of students will need:

• 1 Wide bore dropper with tip cut off

• 1 -9 inch length of “Serpent Skin” tubing or dialysis tubing.

• 1- 10 oz. tall form clear plastic cup

• 1- 15 ml conical tube or test tube labeled “Simulated Red Blood Cells” – add 1-2 ml of redglitter or red seed beads

• 1- 1.5 ml microtube labeled “Glucose” – fill with 1 ml BAKING SODA (not glucose)

• 1- 1.5 ml microtube labeled “Simulated Urea” – fill with 0.5 ml yellow food color and 0.5 ml water

• 1- 1.5 ml microtube labeled “Protein” – fill with 1 ml BAKING SODA (not protein)

• 1 small paper packet of salt

• 1 small plastic bag labeled “Test Paper” - fill this bag with:

o 1 strip of chromatographypaper(whitepaper)

o 1 strip of salt testing paper

o 1 strip of RED litmuspaper(pinkpaper)

**B.** Space- Students will be placed into groups of two. They will have everything they need at their particular station. This limits the movement around the room by students.

**C.** No lab stations necessary. All supplies needed are in one station.

**D.** Students will be given their own designated areas to work with one partner.

**2. Material distribution a. What materials do the students need? b. What is the most efficient way to get these to students?**

**A.** All supplies needed for this lab will be provided by the teacher.

**B.** The supplies will be properly labeled and waiting for the students.

**3. Pre Lab a. Expectations/objectives/purpose for the day b. Safety considerations c. Overview of lab set-up d. What to do if lab is not completed during the hour e. How this lab fits into the curriculum f. Clean up**

**A.** **Student Tasks:** Create a simple miniature model of a kidney dialysis machine. Determine which molecules can diffuse through the dialysis membrane.Explain what substances should be included in the dialysate to ensure that essential and beneficial small molecules are not lost from the blood.

**B.** Materials used are not harmful. Students may want to be careful handling the food coloring because it will stain their hands and clothing.

**C.** Students will be told what materials are needed for each step of the lab. They will be instructed not to touch the materials until they are needed during the lab.

**D.** If lab is not completed during the class time provided, the students can take the handout home to finish the questions. The handout provides the necessary information to answer all the questions.

**E.** This lab is a good way to connect diffusion and osmosis to kidney filtering of blood. Students are able to see what happens inside a kidney, during the filtering of blood.

**4. Hand outs a. Procedure (can also be at lab stations) b. Data recording c. Application/analysis**

**A.** Procedure is posted directly on the lab handout for easy access. Students are able to read through their own handout while working through the steps.

**B.** A data table is provided in the handout. This table allows students to make their predictions and compare these predictions to what actually happens.

**C.** Students are asked to analyze what happens during a class discussion. The teacher will ask what they seen and why it happened.

**5. Assessment a. How do I assess whether or not students are doing lab properly? b. What will I have students do with their data? c. How will I know that students have understood the concept the lab was**

**illustrating?**

**A.** The students will be assessed on their ability to follow directions. The students will be watched closely to make sure that they are doing the lab correctly.

**B.** The data collected from the lab will be placed in a table. This will allow the students an easy way of finding their data when answering the questions.

**C.** The students’ handouts will be graded. They will be graded on the completion of the work as well as their ability to answer the questions thoroughly. Students will also be asked to explain their answer in a class discussion the next day.

**6. Post lab a. What to do with data/discussion b. Taking stock of student progress c. What to do if not completed d. Preview of tomorrow**

**A.** The teacher will lead a discussion on the results of the lab. The students will be asked to explain their findings and why they think that they occurred. They will also be asked to explain how the lab relates to the material that is being covered during the unit.

**B.** Grades will be monitored to see if the students are making any progress in their lab methods. Labs are very important to help students understand the concepts. They help make abstract concepts more concrete. They can actually see the functions of certain structures.

**C.** If the lab is not completed during the lab time, students can take it home as homework. It will be due the next class period. Points will be deducted from the lab if students turn it in late.

**D.** We will continue with the urinary system unit. The material will go in more depth of the functional unit of the kidney, the nephron. We will also begin going over the pathway of urine through the urinary system.